Factors influencing consumer preferences for goat meat

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Abstract

In recent years, there has been a dramatic spike in meat prices in Algeria and globally and this has substantially influenced meat consumption trends. The study aims to understand the factors that influence consumer perceptions and goat meat consumption behaviour in Algeria. This study included 240 participants using random selection who were surveyed using a self-administered questionnaire through face-to-face interviews. At least 83% of the participants preferred the animals to be less than a year old, whereas only 2.9% opted for animals above two years of age. The male participants preferred male animals over female animals (81.3% *vs* 50.9%). Female participants preferred female animals (49.1% *vs* 18.7%). Among the breeds, Arbia was preferred over Makatia by 91.2% of participants in terms of sex and age. In terms of meat choice, the thigh muscle was the predominant choice among the female respondents (55.7%), whereas the shoulder cut was preferred by male respondents (49.3%). Nutritional features, health features, preparation time, conservation, information from previous consumers, and animal welfare concerns were found to primarily influence goat meat consumption among the participants. The study findings strongly reflect the trends and the strategies to be implemented in understanding consumer requirements to boost the consumption of goat meat, thereby transforming this into a stable income source in the meat product market.

Introduction

Farming occupies a crucial component of the economy in developing countries. These countries seldom hold high farming potential and it is therefore imperative to check for animal adaptabilities to varying climates and dietary conditions in animal husbandry (Sejian *et al.*, 2021; Abhijith *et al.*, 2023). Goats share unique physiological features that allow them to exploit the resources despite the harsher climatic conditions compared to the other small livestock thereby making them suitable for rearing in such climates (Monteiro *et al.*, 2017; Mazhangara *et al.*, 2019). Considering climate change, the world is currently focused on the food sources that are more suitable to these ever-changing conditions. Therefore, goat-keeping has not only emerged as a solution to world hunger but also a reliable alternative, given its low methane emissions compared to other livestock (Darcan & Silanikove, 2018).

According to Utaaker *et al.* (2021), in the past four decades, goat production has more than doubled and was estimated to be ~6 million tonnes in 2021, mainly in Asia and Africa (90%), with substantial numbers in other countries, including China (39%), India (9%), Pakistan (6%), Nigeria (4%), Bangladesh (4%), Australia (1%), and others (38%) (MLA, 2020; FAOSTAT, 2021). In 2018, the goat population in Algeria was estimated to be 4.9 million (FAOSTAT, 2018).

In Algeria, by the year 2021, goat meat production had risen to ~18 quintal but represented only a small percentage (12% and 7%) compared to beef and sheep, respectively (FAOSTAT, 2021). However, goat meat has still been reported to be an important protein source in Algeria for the local population, particularly in the mountainous, steppe, and Saharan areas (Mouhous *et al.*, 2021; Ouchene-Khelif *et al.*, 2021; Lamri *et al.*, 2022).

Goat meat contains high protein, vitamins, minerals, a lower proportion of fat (especially cholesterol) compared to other meat (Ivanović *et al.*, 2016; Koşum *et al.*, 2019), rendering it a healthier option than red meat (Mazhangara *et al.*, 2019). Furthermore, goat meat is known for its taste due to hedonic characteristics and is estimated to contribute for the high meat consumption among the population (Mandolesi *et al.*, 2020; Mazhangara *et al.*, 2022). The quality of the meat differs substantially with age, muscle type, gender, dietary patterns, age of slaughter, and breed (Casey & Webb, 2010; Guzman *et al.*, 2019; Sesay, 2023).

The concerns expressed by the consumers are various in nature and include the safety of the meat, health of the animals, nutrition, ethical, and environmental aspects (Mandolesi *et al.*, 2020; Kantono *et al.*, 2021; Estévez-Moreno & de la Lama, 2022). According to Mouhous *et al.* (2021), there has been a shift in the Algerian consumer behaviour towards goat meat, influenced by the knowledge related its dietary and organoleptic characteristics. The studies on meat consumption of goat meat and the factors that impact consumer behaviour are limited. Thus, the purpose of this study was to investigate consumer preferences for goat meat and the factors influencing it consumption, which need to be addressed to contribute to a better awareness and acceptability of this meat among consumers.

Materials and methods

Ethics approval was obtained from the Ethics Committee of the Faculty of Life and Natural Sciences at the University of El Oued with application reference number 22/2023.

The current study was conducted in the year 2023 between the months of March and April in the El Oued region in the southeastern part of Algeria. This district is geographically situated at 33° 7′ 0″ N, 7° 11′ 0″ E and is 630 km from the capital, Algiers. This place is known for its harsh climatic conditions in terms of average annual rainfall and day and night temperatures. The most common occupation for the population in the area is mainly agricultural activities, such as farming and animal rearing.

The study sample included a total of 240 respondents with varying demographic characteristics (Table 1). Participants were randomly selected for the survey. The inclusion criteria for the study were that the participants were >18 years, expressed a willingness to participate in the study, and should have consumed goat meat previously. Oral consent was obtained at the beginning of every interview. To ensure that the data is not duplicated while also guaranteeing the anonymity of responses, questionnaires were identified by different codes, instead of respondent's names.

The study included a structured, self-administered questionnaire to collect the information of consumer preferences and the factors influencing goat meat consumption among the participants. The questions were a mixture of open-ended and close-ended questions. The questionnaire included a total of three parts; the aspects of socio-demographic characteristics including age, gender, education level, region, and income level were in the first part. The second part included eating preferences of consumers, such as animal age, sex, genotype, and anatomical location. The third part of the survey investigated the driving factors of the consumer's decision to eat goat meat. The questions of this section included animal welfare, meat origin, and previous knowledge, lifestyle habits, cultural habits, preparation period, and conservation. Data collection was performed using face-to-face interviews with participants.

Statistical Package for Social Sciences (SPSS v 27.0) was used to analyse survey responses and descriptive statistics were produced using Microsoft Excel (2007) software. The correlation between goat consumption and its influencing factors was established using chi square tests, with a *p*-value of less than 0.05 considered statistically significant.

Results

The socio-demographic profiles, including the components of sex, age, residential area, educational level, and income are shown in Table 1. The participants belonged to the following age groups: 37.1% were 31–40 y of age and 22.9% were 18–30 y, and 41–50 y. Male respondents accounted for 55.8% (134) of the participants, whereas 44.2% (106) were female. In terms of educational level, 44.2% had a university education, with 30.4% with a Bachelor's degree. Only 2.1% of participants were illiterate. A total of 73.3% lived in less densely-populated areas, whereas 26.7% lived in urban areas. The income of these respondents was acceptable (69.6%) and of low income (30.4%).

Table 1 Socio-demographic characteristics of respondents (n = 240)

Characteristics	Frequency (n)	Percentage (%)
Age (years)		
18–30	55	22.9
31–40	89	37.1
41–50	55	22.9
51–60	22	9.2
Over 60	19	7.9
Gender		
Male	134	55.8
Female	106	44.2
Education level		
Primary	15	6.2
Secondary	41	17.1
Tertiary	73	30.4
University	106	44.2
None	5	2.1
Residence area		
Rural	176	73.3
Urban	64	26.7
Income level		
Acceptable	167	69.6
Low	73	30.4

The participants' preferences in terms of animal age, gender, breed, and muscle are listed in Table 2. The age of the animals of 0 months to 1 year was the most preferred one for the majority of the respondents (83.3%). The upper limit of acceptability was of ~2 y old (2.9%). In terms of animal sex, 81.3% of male respondents preferred eating male goats, as compared to female respondents (50.9%). The female respondents (49.1%) preferred eating female animals, compared to 18.7% of males. The Arabia breed was preferred to the Makatia breed (91.2% to 8.8%, respectively). Furthermore, 55.7% of the female respondents preferred thigh muscle over shoulder meat (31.1%), whereas males preferred the thigh (40.3%) after the shoulder meat (49.3%).

Table 3 illustrates the impact of various factors on meat consumption willingness. All the investigated factors (except the consumers' lifestyle habits) had an effect ($P < 0.05$) on the consumers' decision to consume goat meat. In this context, it is interesting to highlight that the nutritional ($\chi^2 = 61.357$; $P = 0.000$) and the health attributes ($\chi^2 = 55.940$; $P = 0.000$) of meat were the strongest determinants of consumer readiness. Others included the meat preparation time at the butcher or at the market and its preservation was also identified as a determinant ($\chi^2 = 25.583$; $P = 0.000$), followed by previous knowledge ($\chi^2 = 20.132$; $P = 0.000$), and animal welfare concerns ($\chi^2 = 11.976$; $P = 0.001$). Consumer preparedness to eat goat meat was related to the meat price ($\chi^2 = 8.402$; $P = 0.004$), the cultural habits of the participants ($\chi^2 = 7.294$; $P = 0.007$), and the origin of the meat ($\chi^2 = 6.284$; $P = 0.012$).

Table 2 Age, sex, breed, and muscle preferences of consumers for goat meat of both sex and age categories

Variable	Sex, n (%)					Age, n (%)							
Age	**Male**	**Female**	**Total**	x^2, F	*P* value	**18–30**	**31–40**	**41–50**	**51–60**	**>60**	**Total**	x^2, F	*P* value
0–6 months	48(35.8)	37(34.9)	85(35.4)			11(20.0)	38(42.7)	19(34.5)	11(50.0)	6(31.6)	85(35.4)		
6 months–1 y	69(51.5)	46(43.4)	115(47.9)	6.433	0.091	27(49.1)	41(46.1)	30(54.5)	7(31.8)	10(52.6)	115(47.9)	20.176	0.064
1 y– 2 y	12(9.0)	21(19.8)	33(13.8)			13(23.6)	9(10.1)	5(9.1)	4(18.2)	2(10.5)	33(13.8)		
>2 years	5(3.7)	2(1.9)	7(2.9)			4(7.3)	1(1.1)	1(1.8)	0(0.0)	1(5.3)	7(2.9)		
Gender													
Male	109(81.3)	54(50.9)	163(67.9)	25.101	0.000	33(60.0)	56(62.9)	40(72.7)	18(81.8)	16(84.2)	163(67.9)	7.451	0.114
Female	25(18.7)	52(49.1)	77(32.1)			22(40.0)	33(37.1)	15(27.3)	4(18.2)	3(15.8)	77(32.1)		
Breed													
Arbia	119(88.8)	100(94.3)	219(91.2)	2.270	0.132	54(98.2)	78(87.6)	49(89.1)	19(86.4)	19(100.0)	219(91.2)	7.809	0.073
Makatia	15(11.2)	6(5.7)	21(8.8)			1(1.8)	11(12.4)	6(10.9)	3(13.6)	0(0.0)	21(8.8)		
Muscle													
Neck	6(4.5)	7(6.6)	13(5.4)			2(3.6)	4(4.5)	6(10.9)	1(4.5)	0(0.0)	13(5.4)		
Ribs	8(6.0)	5(4.7)	13(5.4)			4(7.3)	2(2.2)	4(7.3)	0(0.0)	3(15.8)	13(5.4)		
Thigh	54(40.3)	59(55.7)	113(47.1)	10.540	0.022	29(52.7)	45(50.6)	20(36.4)	11(50.0)	8(42.1)	113(47.1)	16.008	0.452
Legs	0(0.0)	2(1.9)	2(0.8)			0(0.0)	1(1.1)	1(1.8)	0(0.0)	0(0.0)	2(0.8)		
Shoulder	66(49.3)	33(31.1)	99(41.3)			20(36.4)	37(41.6)	24(43.6)	10(45.5)	8(42.1)	99(41.2)		

Table 3 Factors influencing willingness to eat goat meat

Factors	Consumption readiness (Yes) n (%)	Consumption readiness (No) n (%)	Odds Ratio	(χ^2)	*P*-value
Animal welfare					
Yes	113(83.1)	23(16.9)	1	11.976	0.001
No	66(63.5)	38(36.5)	0.353		
Origin					
Yes	63(85.1)	11(14.9)	1	6.284	0.012
No	116(69.9)	50(30.1)	0.405		
Previous information					
Yes	135(83.3)	27(16.7)	1	20.132	0.000
No	44(56.4)	34(43.6)	0.258		
Lifestyle habits					
Yes	99(78.0)	28(22.0)	1	1.615	0.204
No	80(70.8)	33(29.2)	0.685		
Cultural habits					
Yes	79(84.0)	15(16.0)	1	7.294	0.007
No	100(68.5)	46(31.5)	0.412		
Preparation time and preservation					
Yes	96(90.6)	10(9.4)	1	25.583	0.000
No	83(61.9)	51(38.1)	0.169		
Price					
Yes	65(86.7)	10(13.3)	1	8.402	0.004
No	114(69.1)	51(30.9)	0.343		
Availability					
Yes	70(82.4)	15(17.6)	1	4.191	0.041
No	109(70.3)	46(29.7)	0.507		
Nutritional attributes					
Yes	154(88.0)	21(12.0)	1	61.357	0.000
No	25(38.5)	40(61.5)	0.085		
Health attributes					
Yes	161(85.6)	27(14.4)	1	55.940	0.000
No	18(34.6)	34(65.4)	0.088		

Discussion

Previous research has indicated that customer behaviour, preference, as well as their acceptability for goat meat are strongly influenced by quality cues, especially sensory ones such as texture, flavour, ease of cooking, juiciness, colour, and odour (Keskin *et al*., 2012; Bakhsh *et al*., 2019; Mandolesi *et al*., 2020; Mazhangara *et al*., 2022). The listed characteristics may vary depending on animal age, breed, sex, anatomical location, weight at the time of slaughter, proportion of fat, feeding system, and cooking technique (Koşum *et al*., 2019; Guzman *et al*., 2019; Sesay, 2023). Participants expressed a preference towards younger animals (< 1 y) as they believed that the meat was relatively tender. The study by Bakhsh *et al*. (2019) supported these results, stating that the optimum slaughter age, especially in terms of tenderness, for goats was nine months. Several other studies support these observations (Simela *et al*., 2004; Pratiwi *et al*., 2007; Bakhsh *et al*., 2019; Pophiwa *et al*., 2020). Furthermore, in this context, Simela *et al*. (2004) in their study on unimproved indigenous goats of South Africa stated that *semimembranosus* muscle of 8-tooth goats had higher shear force values (77.4 N vs. 59.9 N) than that of 2-tooth goats.

The sensory characteristics were studied by Pratiwi *et al*. (2007) and a negative association between weight at slaughter and sensory scores, such as tenderness (-0.84), juiciness (-0.82), flavour (-0.59), and overall acceptability (-0.82) were observed in cooked *longissimus thoracis* muscle, in their study on feral goats slaughtered at 5, 10, 20, 30, 40, 50, 60, and 70 kg. Considering these findings, the optimum weight was 40 kg for ideal meat quality. A study by Saccà *et al*. (2019) observed the presence of meat quality traits and expression of tenderness-related genes in the *longissimus lumborum* of young goats. The findings conveyed the difference in the meat of suckling goats (5 w of

age) as more tender than that of post-pubertal goats (34 w of age), whereas meat from goats slaughtered at 17 w had intermediate shear force values. In a study by Borgogno *et al.* (2015), the quality of the meat obtained in milk-fed goats (1–1.5 months old) and older goats (4–6 months old) was less tender and had higher cooking losses compared to those slaughtered at 3–4 months. This is explained in the study Bakhsh *et al.* (2019), where they attributed the negative relationship observed between animal age and meat tenderness to three essential factors (the crosslinks of connective tissues, the perimysium thickness, and the percentage of type IIA fibres).

In the current study, the results revealed a preference of male consumers for male goats, despite the smell attributable to the androgenic effect at puberty (Koşum *et al.*, 2019; Mandolesi *et al.*, 2020; Mazhangara *et al.*, 2022). The male participants responded that the male goats were of exquisite flavour compared to their female counterparts at a young age. This reveals that the aromatic nature, sensitivity of the issue, and universally-acceptable goat meat are more qualified in male that female goats (Koşum *et al.*, 2019). Another reason is the presence of excessive fat in the female goats, which is particularly disliked by those suffering from chronic diseases. Casey & Webb (2010) highlighted this aspect in their study that the females had more kidney and pelvic fat than males, which can be considered as early developing fat depots. Sebsibe (2008) stated that under similar management conditions, females gained more fat compared to male goats. According to some opinions, female physiological characteristics such as pregnancy and lactation might negatively influence the meat quality, principally in terms of tenderness. Casey & Webb (2010) concluded that the live animal's physiological state, the fat and connective tissue, and the biochemistry of the post-mortem muscle directly influenced the palatability of the meat.

In support of previous claims, Rodrigues & Teixeira (2009) studied the relationship between meat quality, sex, and carcass weight and found that the males displayed increased juiciness. Some of the older participants mentioned the need to retain the female goats for reproductive purposes to preserve the local breeds (cultural patrimony). Participants chose the Arabia over the Makatia breed; this might be explained by the former's rearing strategy, which included free-range pasture management, which might be the cause of the increased juiciness. Typically, the health and the naturalness of any meat depends on the conditions and may explain the hierarchy of the production system for the consumers' interests (Henchion *et al.*, 2017). The animal's diet might be a distinct feature of specific production systems, such as organic or grass-fed animals and it can influence meat composition and sensory characteristics (Monahan *et al.*, 2018). Additionally, the consumer ethnocentric tendencies are a possible explanation for the breed effect on consumer behaviour in the current study. According to Kawęcka *et al.* (2022), the traditional production systems used for local breeds, with extensive grazing on natural pastures, have particular relevance in meat quality. In this context, consumer ethnocentricity is a normative aspect related to country of origin. In cases where the consumers hold beliefs against imported products and emphasise products to boost the domestic economy, morality, and patriotism; consequently, consumers overestimate local products and they prefer them and are morally obliged to buy them (Montossi *et al.*, 2013; Kilders *et al.*, 2021; de Araújo *et al.*, 2022). Across several countries, the demand for traditional foods has spiked with clear consumer interest in the various qualities and attributes of meat associated with local products (Bernués *et al.*, 2012; Hersleth *et al.*, 2012; Mandolesi *et al.*, 2020; Kantono *et al.*, 2021). De Araújo *et al.* (2022) claim that there are various reasons why consumers choose local products, and their attitudes towards locally-produced foods are multiple and shaped by consumer perceptions. Consumers criticise the growing number of imports into the national food market, consider local foods more environmentally-friendly, and perceive local foods as fresher, safer, and healthier (Feldmann & Hamm, 2015; Likoudis *et al.*, 2016; Mandolesi *et al.*, 2020).

The literature documents the influence of anatomical features and location as one of the factors that influence the muscle chemical components and consequently contribute to the characteristic quality attributes of goat meat (Webb *et al.*, 2005; Gigli & Saltalamacchia, 2007; Sebsibe, 2008; Madruga & Bressan, 2011). In that sense, the women participants of our study preferred the thigh muscle and attributed this to the fact that this muscle was tastier than the other locations. This observation concurs with that of Garmyn (2020), who reported that consumers could recognise marbled patterns and, as a result, distinct flavours in specific muscles and were prepared to pay a premium for the flavour profile that best suited their tastes. Women believed that the thigh muscle was more tender, more accessible to cook, and more adequate for most meals in their dietary patterns than other muscles. In disagreement with the idea of the consumers surveyed in the current study, Pophiwa *et al.* (2017) found that the *longissimus* muscle had an acceptable degree of tenderness at 24 h post-mortem, with an average shear force value of 42.8 ± 1.5 N, whereas the *semimembranosus* was tough, with an average shear force value of 88.5 ± 3.8 N. Sebsibe (2008) highlighted that exercised muscles were usually less tender than support muscles and the more a muscle was used,

the stronger it became, and therefore the tougher the cut of meat was. The increased toughness of muscle is mostly due to increased connective tissue and collagen concentration (Bakhsh *et al.*, 2019; Kantono *et al.*, 2021). Accordingly, Madruga & Bressan (2011) stated that the amount, distribution, and composition of connective tissue in goats vary according to the muscle considered. The preference of males for the shoulder cut assessed in our study can be explained by the fact that the males believed that this muscle was usually tastier than the others.

Apart from insufficient protein and dietary fibre levels in meat, some serious health concerns in the senior population have been linked to micronutrient deficiencies. These deficiencies have been related to an increased risk of cardiovascular illness, weight loss (decreased muscle strength and mass), and a reduced ability to overcome chronic or infectious diseases (Assis *et al.*, 2018). Numerous studies of older adults have found an increased risk of vitamin and mineral deficiencies, such as reduced levels of zinc, calcium, and selenium (Kehoe *et al.*, 2019; Yu *et al.*, 2022). Barchielli *et al.* (2022) claimed that high selenium levels were correlated with a reduced risk of mortality and heart failure. Our study showed that the potential factors influencing goat meat consumption were its nutritional and health features. In this context, goat meat is usually considered a high-protein food that provides all the required amino acids and is a good source of minerals such as iron, selenium, zinc, and vitamin B (Koşum *et al.*, 2019). Goat meat is considered lean, with less fat, cholesterol, and saturated fatty acids compared to lamb and mutton, so is healthier than other types of red meat, which is advisable for consumers of a more sensitive health status like children, the elderly, cardiovascular patients, and convalescents (Vnučec *et al.*, 2020; Mazhangara *et al.*, 2022).

The satisfaction of the consumer's basic needs is still a central preoccupation when choosing the foods which must be included in their meals (Mandolesi *et al.*, 2020). The respondents in our study believed that including goat meat in their dietary patterns was perceived as a primary nutritious and healthy choice for a healthy life. Similarly, Pophiwa *et al.* (2020) reported that goat meat's increasing popularity globally is attributable to its distinctive leaner and nutritious characteristics. Furthermore, nutritional information and perceived healthiness were previously pointed out as notable motivators that might positively affect the willingness to purchase and consume goat meat products (Lamri *et al.*, 2022).

Animal welfare is a crucial element for the sustainability of meat consumption and is a term used to express ethical concerns about the quality of life experienced by animals, particularly animals used by human beings in animal production (Hansen & Østerås, 2019). During the last decades, society has become increasingly concerned about animal welfare concerns (Montossi *et al.*, 2013; Mulder & Zomer, 2017; Komarek *et al.*, 2021; Dagevos & Verbeke, 2022; Estévez-Moreno & de la Lama, 2022; Liu *et al.*, 2023). Our results showed that the respondents assigned great importance to this factor, and consequently, a substantial influence of animal welfare on goat meat consumption was observed. Consistent with our findings, several studies have reported that ethical motives play a central role in consumers' preferences, behaviour, and perception of meat, as well as other food choices (Font-i-Furnols & Guerrero, 2014; Alles *et al.*, 2017; de la Lama *et al.*, 2017; Stampa *et al.*, 2020; de Araújo *et al.*, 2022). Our study showed that the consumer perception of goat meat was positive when animal welfare was considered and negative when welfare was compromised.

Additionally, the participants in the survey believed that animal welfare was closely related to animal farming and management systems. The level of animal welfare provided to livestock is directly determined by farm management practices, pre-slaughter practices, and logistics (Bell *et al.*, 2017). According to the participants in the current investigation, under extensive and free-range pasture production systems, animals are free to move within a habitat, which allows them to perform their physiological and behavioural functions best and boosts their meat quality. According to Musto *et al.* (2015) and Mandolesi *et al.* (2020), ethical attributes such as pasture access and freedom of movement might influence consumer behaviour because these attributes imply safety and healthiness. However, smallholder or intensive farming systems adversely affect animal welfare and might compromise their well-being. These latter systems are frequently associated with the minimisation of animal movement and confinement in yards. Previous reports have stated that animals reared under an intensive production system can experience nutritional imbalance, which can be induced by compromises in the application of nutritional and husbandry practices (Montossi *et al.*, 2013). The environment, including surfaces and flooring, high stocking density, and the provision of concentrated feeds can create challenges to animal health and welfare, which may compromise animals or amplify the effect of any existing problem. Previous authors have highlighted that good pastures, adequate use of them, and restricted grain supplementation not only increase production and animal carcass and meat quality, but also improve animal welfare. For these reasons, recent studies have mentioned that the way meat is produced has been a growing concern for consumers, in

terms of environmental, social, ethical, and animal welfare aspects (Alonso *et al.*, 2020; Teixeira & Rodrigues, 2021). Our study revealed that animal welfare concerns expressed regarding rearing systems and conditions, can be a major determinant of goat meat consumption acceptability, thus providing a potential tool for meat differentiation based on rearing systems and respect of animal welfare. Estévez-Moreno *et al.* (2021) highlighted that animal welfare can be a focal point of policies aimed at improving the sustainability of animal production, linked with environmental conservation, the re-evaluation of farming work, and the preservation of rural livelihoods.

It is interesting to highlight that the origin of the meat was considered an important determinant for the consumption of goat meat. More specifically, participants often mentioned the attribute, "local". They referred to the origin of the meat as an incentive for consuming goat meat and an indicator of freshness and quality. Similarly, Mandolesi *et al.* (2020) showed that the origin was the second most salient characteristic of goat and sheep meat for consumers; meat coming from local producers was highly appreciated by the majority of the consumers identified in their study. Ardeshiri & Rose (2018) indicated that origin was the primary extrinsic factor in Australian beef purchasing decisions. Indeed, the strong relationship between meat of "local origin" and consumption willingness can be explained by the fact that the consumers believe that meat produced locally implies higher quality control, leading to more trust and safety in the quality of the product. According to de Araújo *et al.* (2022), many consumers have redirected their preferences towards local meat products, i.e., meat and meat products that have travelled shorter distances or meat products marketed directly by the producer. This also ensures that meat products meet certain specific characteristics and qualities. However, in another study conducted by Lamri *et al.* (2022) regarding the consumption of goat meat and its influencing factors, the place of origin was not a salient association for the consumers; origin was placed fourth of the five main purchase criteria included in the survey.

Montossi *et al.* (2013) stated that meat sensory evaluation by consumers from different regions can produce differences in acceptability. As part of these sensory differences, other aspects inherently affect their evaluations and preferences for meat depending on its origin. The effect of origin includes aspects related to consumer's beliefs, feelings or emotions, moral considerations, and interaction amongst these (Font-i-Furnols & Guerrero, 2014). In this context, expectations created by consumers due to the origin of meat can influence their preference or acceptability, either positively or negatively (Ardeshiri & Rose, 2018; Garavaglia & Mariani, 2017; Napolitano *et al.*, 2020).

Additionally, it has also been proven that the five major reasons for purchasing national products are a combination of collective/public and individual/particular benefits and include distance with respect to the origin of the products, support for local and national farmers, environmental concerns, taste and freshness of products, and especially, confidence in animal welfare insurance systems (Fernández-Ferrín *et al.*, 2019). Consequently, the participants in our study believe that you have a social responsibility to support the small local farmers by boosting purchase and consumption of their products. Moreover, the respondents think that a preference for goat meat produced in their region adds value to local breeds, which might contribute to their conservation. Promoting local breeds was also identified as a priority to preserve diversity and cultural heritage among the participants.

Typically, perception refers to how a person chooses, organises, and interprets information about the external environment and transmits it to the brain for initial processing (Burton *et al.*, 2014). The interpretation phase involves higher cognitive processes, such as semantic processing of the information received based on the existing knowledge and experiences (Hati *et al.*, 2021). The combination of affective and cognitive aspects drives our understanding and purchase decision of products or services (Font-i-Furnols & Guerrero, 2014). Based on the findings, the consumers' prior knowledge was also an important factor in our study. This further emphasises the influence of the availability of information to the consumer and their acceptance of goat meat, especially that grown organically rather than supplied through marketing strategies. Recently, Mazhangara *et al.* (2022) reported the increasing consumer consciousness of well-being; this awareness influences the acceptability of goat meat.

Lamri *et al.* (2022) highlighted that 60% of the participants were willing to buy more goat meat if additional information on its beneficial features were made available. The researchers concluded that improved communication and enhanced awareness of the beneficial effects of goat meat in terms of its healthiness and nutritional characteristics compared to other red meats could be advantageous and increase its acceptability among consumers. It is well established that consumers are interested in having information about the origin of the meat and the production methods, traceability, and possible positive effects on human health (Mandolesi *et al.*, 2020). Thus, for the previous reasons, the participants in our study disclosed that they would usually like to receive clear and precise information regarding any food introduced into their diet. The relationship between the consumer's acceptance of

goat meat and their awareness of its features can be explained by the fact that the information induced more trust in the product's quality and tenderness. This explanation corroborated another interesting finding, which reported that 62% of participants were likely to use social media such as Facebook and Twitter as valuable sources to gather information about meat safety incidents (Howard, 2015). In another study, D'Alessandro *et al.* (2012) claimed that providing information to consumers about feeding or animal welfare practices in terms of lamb rearing conditions influenced consumer acceptability, moving it towards the satisfaction of their expectations. A recent investigation by de Araújo *et al.* (2022) showed that experience, memory, and information were essential factors that shaped consumer perception and attitude.

Consequently, the information received from the media and social media strongly influences consumer behaviour and perception. According to previous authors, consumer perception depends on how the data is transmitted. They stated that product information is crucial to positively or negatively influence consumer perceptions. In this sense, consumers who know less about the product and information they receive are more influenced by common sense, often false beliefs, and information from the mainstream media. This statement regarding the influence of product information is strongly supported by the fact that, in recent years, much negative attention has been given to meat products, mainly linked to health and sustainability aspects, which has influenced the consumer's view and behaviour, often determining consumption. Conversely, opinions and information can be one of the main aspects that shape the consumer's perspective when correctly conveyed (Tomasevic *et al.*, 2020; de Araújo *et al.*, 2022). On the whole, it appears from our study that the information transmitted can inform the consumer and influence their perception of food.

Consumer lifestyle was not found to influence the consumption of goat meat substantially. The participants shared dietary and living conditions and geographic area. Contrastingly, Kantono *et al.* (2021) stated that in some cultures, such as in the Chinese, eating habits were found to be weakly associated with purchasing decisions and willingness for consumption. Mao *et al.* (2016) also reported that the eating habits of Chinese consumers were an important factor that influenced meat consumption and preference. Strydom *et al.* (2019) conducted a study on the eating habits of South African consumers from rural or urban backgrounds and found that the frequency of eating meat, degree of cooking, and cooking method did not substantially influence the meat-buying intention and willingness to eat it.

Previous studies have indicated that the popularity of goat meat among societies has been related to the consumer eating habits and regional differences (Borgogno *et al.*, 2015; Traoré *et al.*, 2018; Koşum *et al.*, 2019; Mandolesi *et al.*, 2020). Although lifestyle has shown a weak relationship with consumer purchase decisions, it is still considered to be an essential factor (Stampa *et al.*, 2020; de Araújo *et al.*, 2022). The parameters of lifestyle for consumers indicated that residence in either urban or rural regions, sedentary or active people, and slow-cooked or convenient food could drive the search for the products (Estévez-Moreno *et al.*, 2021; de Araújo *et al.*, 2022). Consumers residing in remote locations such as rural and mountainous areas s were found to prefer meat, which is traditional, unadulterated, and artisanal, such as goat (Koşum *et al.*, 2019). In contrast, in the city, the consumers' choice is influenced by the purchase offers and the access to new products (de Araújo *et al.*, 2022). Mandolesi *et al.* (2020) further found that young consumers living in urban areas prefer fast and easy-to-make recipes and diets with less fat and less red meat.

The current study emphasises that the consumers' cultural habits play a substantial role in the willingness to consume goat meat. Studies have focused on the positive influence of cultural elements on a community's perception and its consumption of goat meat (Koşum *et al.*, 2019; Mazhangara *et al.*, 2022). this sense, Mazhangara *et al.* (2022) revealed that meat consumption was reserved for cultural and religious ceremonies in South Africa. Lamri *et al.* (2022) reported that 49.7% of the Algerian consumers in their study said meat consumption was restricted to religious and sociocultural occasions such as family celebrations or religious feasts of the sacrifice "Aid Al Adha", the birth of a child, circumcision, and for welcoming visitors, confirming the meat-consuming habits of various African countries, including Algeria (Gagaoua & Boudechicha, 2018; Traoré *et al.*, 2018; Marius *et al.*, 2020). Food literacy, health literacy, and taboos around certain food items are other sociocultural factors impacting the perception of meat products (Traoré *et al.*, 2018; de Araújo *et al.*, 2022). The researchers comment that informed individuals can understand the acquired information, interpreting and applying it to understanding the origin of the food and its production and processing method (de Araújo *et al.*, 2022). By integrating nutrition-related information, one can evaluate the impact on health. However, socioeconomic status might influence the availability and understanding (Traoré *et al.*, 2018; de Araújo *et al.*, 2022). Consequently, food taboos and their impacts will be accentuated in these groups. Higher education level, increased access to information, and higher income were

positively correlated with appropriate knowledge of the daily nutritional value of food products and restriction of food taboos. Some of the studies linked a nation's traditions and its population's cultural habits to influencing food choices (Czine *et al.*, 2020; Kantono *et al.*, 2021).

Our study reveals that the preparation time and preservation capacity were the most important factors determining the eating of goat meat. Most participants in the study believed that the meat offered at the butcher's shop or at the markets with higher preservation duration in their homes was ideal. This belief might be based on the understanding that the meat had travelled for a short period between the butcher and the farm and was relatively fresh and safe to consume (Bond *et al.*, 2009; Mandolesi *et al.*, 2020). The consumers considered meat storage time and conditions for freshness and healthiness.

The literature on the perception of consumers presents that visual appearance such as meat colour, marbling, drip loss, and fat content are strongly related to consumer's expectations and experience (Verbeke *et al.*, 2005; Banović *et al.*, 2009; Kantono *et al.*, 2021). These were also found to play a vital role in both the purchase and consumption decisions of consumers as they are used as parameters for high quality and tenderness (Banović *et al.*, 2012; Mandolesi *et al.*, 2020; Kantono *et al.*, 2021). The quality attributes of meat, such as freshness, taste, and tenderness, were strongly associated with prior consumer experience and influenced the intention to purchase and willingness to pay and consume (Banović *et al.*, 2009). Supporting studies, such as Bernués *et al.* (2012), found that meat's fresh appearance and light colour were considered essential quality indicators and drove the consumers' decisions. In another quality testing study by Kantono *et al.* (2021), a significant proportion of the participants (63.89%) revealed a preference for freshness as a key factor in purchasing red meat.

Mazhangara *et al.* (2022) studied the profiles of goat meat consumers in South Africa and stated that the colour and fresh appearance of goat meat were among the critical quality indicators for consumer preference at 26.75% and 16.87%, respectively. Ripoll *et al.* (2019) also emphasised the importance of the appearance of the meat and its colour in purchasing decisions. It is critical to note that meat is relatively expensive and available in limited quantities, whereas some authors label it "comfort food" (de Araújo *et al.*, 2022). The participants revealed their preference for meat varieties with longer preservation times. The relatively small sample size surveyed (n = 240) in comparison to the total population in Algeria represents a constraint which emphasizes the need for caution in generalizing the results obtained. It is therefore recommended that future investigations be undertaken on a more representative and larger population size to enhance the applicability and robustness of the findings.

Conclusion

This paper discusses consumer preferences, perception patterns, and the factors influencing goat meat consumption. Consumers expressed a common perception towards sensory attributes such as tenderness of the meat of younger rather than older animals. A remarkable value was attached to male animals, for ethnicity, cultural, and economic reasons. Female and male participants were found to have different preferences for meat, such as thigh and shoulder cuts, respectively. Factors that influenced meat consumption patterns included nutritional elements, meat preparation time, attitudes towards conservation, animal welfare, cost of meat, culture, and meat availability. In recent years, the meat industry has seen remarkable safety, ethnicity, sensory aspects, health, and environmental changes. Additionally, the content available on social media has substantially shaped consumer perceptions. Thus, all the information obtained in this study can inform future research to identify strategies for meeting consumer expectations as well as a change in marketing demands.

Authors' contributions

BH: conceptualization, methodology, investigation, formal analysis, writing- original draft, writing-review & editing, resources, and visualization; LH: methodology and investigation; MB: investigation; HA: visualisation. Both authors have read and agreed to the final version of the manuscript.

Conflict of interest declaration

The authors declare that they have no conflicts of interest.

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